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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,584	10/24/2003	Baiyi Zhao	2002B130/2	1077
23455 7590 05/12/2009 EXXONMOBIL CHEMICAL COMPANY 5200 BAYWAY DRIVE P.O. BOX 2149 BAYTOWN, TX 77522-2149				
			EXAMINER MCDONOUGH, JAMES E	
			ART UNIT 1793	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/693,584

**Applicant(s)**

ZHAO ET AL.

**Examiner**

JAMES E. MCDONOUGH

**Art Unit**

1793

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 April 2009.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-6, 9-11 and 13-33 is/are pending in the application.  
4a) Of the above claim(s) 18-33 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 2-6, 9-11 and 13-17 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date 4/23/2009  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 13 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

These claims are dependent on a cancelled claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2-6 and 13-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Buchwald et al. (USP 6,307,087).

For the purpose of this action, it is assumed that claims 13-14 depend on claim 2.

Regarding claims 2, 13-16

Buchwald teaches an improved catalyst made by reacting a metal precursor with novel ligand (abstract). Buchwald teaches the use of a ligand that reads directly on the instant invention, reading on Y = biphenyl. (see formula 4, column 7, lines 5-45)

Buchwald teaches that the metal precursor could be  $\text{NiCl}_2[\text{P}(\text{C}_6\text{H}_5)_3]_2$  (column 32, lines 22-32), which would leave chlorines, reading on the limitation of X in the instant claims.

Regarding claims 3-6

Buchwald teaches a ligand reading on these limitations (see formula 24, column 25, lines 56-65).

Regarding claim 17

This claim only further limits claim 16 when y is not equal to 0.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buchwald et al. (USP 6,307,087) as applied to claim 2 above, and further in view of Loveday et al. (US 2001/0044508).

Although, Buchwald does not teach these ligands for the X ligands, Buchwald does teach the use of chloride as these ligands. Buchwald also teaches:

"Transition metal catalyst complexes play important roles in many areas of chemistry, including the preparation of polymers and pharmaceuticals. The properties of these catalyst complexes are recognized to be influenced by both the characteristics of the metal and those of the ligands associated with the metal atom. For example, structural features of the ligand can influence reaction rate, regioselectivity, and stereoselectivity. Bulky ligands can be expected to slow reaction rate; electron withdrawing ligands, in coupling reactions, can be expected to slow oxidative addition to, and speed reductive elimination from, the metal center, and electron rich ligands, in coupling reactions, conversely, can be expected to speed oxidative addition to, and slow reductive elimination from, the metal center.

In many cases, the oxidative addition step in the accepted mechanism of a coupling reaction is deemed to be rate limiting. Therefore, adjustments to the catalytic system as a whole that increase the rate of the oxidative addition step should increase the overall reaction rate (column 1, lines 15-35)".

However, because Loveday teaches "other ligands may be bonded to the metal M, such as at least one leaving group Q. In one embodiment, Q is a monoanionic labile ligand having a sigma-bond to M. Depending on the oxidation state of the metal, the

value for n is 0, 1 or 2...Non-limiting examples of Q ligands include weak bases such as amines phosphines ethers carboxylates, dienes, hydrocarbyl radicals having from 1 to 20 carbon atoms, hydrides or halogens and the like...Other examples of Q ligands include those substituents for R as described above and including..heptyl, tolyl,...phenoxy,... (paragraphs 0053-0054), showing that ligands such as chloride, heptyl, hydride and phenoxy are functionally equivalent, it would have been prima facie obvious to one of ordinary skill in the art at the time of invention, to modify the teachings of Buchwald, by substituting the chloride ligands for other functionally equivalent monoanionic labile ligands such as heptyl, hydride, amines or phenoxy, with a reasonable expectation of success, as suggested by Loveday, and with the expected benefit of being able to tune the reaction rate by adjusting the electronic character of the metal, by changing the labile ligand, and being able to increase or decrease the reaction rate through the increasing or decreasing rate of obtainment of the rate limiting transition state.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Buchwald et al. (USP 6,307,087) as applied to claim 2 above, and further in view of Speiser et al. (USP 7,199,075).

Although, Buchwald does not teach these ligands for the X ligands, Buchwald does teach the use of chloride as these ligands. Buchwald also teaches:

"Transition metal catalyst complexes play important roles in many areas of chemistry, including the preparation of polymers and pharmaceuticals. The properties of

these catalyst complexes are recognized to be influenced by both the characteristics of the metal and those of the ligands associated with the metal atom. For example, structural features of the ligand can influence reaction rate, regioselectivity, and stereoselectivity. Bulky ligands can be expected to slow reaction rate; electron withdrawing ligands, in coupling reactions, can be expected to slow oxidative addition to, and speed reductive elimination from, the metal center, and electron rich ligands, in coupling reactions, conversely, can be expected to speed oxidative addition to, and slow reductive elimination from, the metal center.

In many cases, the oxidative addition step in the accepted mechanism of a coupling reaction is deemed to be rate limiting. Therefore, adjustments to the catalytic system as a whole that increase the rate of the oxidative addition step should increase the overall reaction rate (column 1, lines 15-35)".

However, because Speiser teaches that a catalyst comprising  $L_2NiX_2$ , where L is equal to a bidentate ligand, and X can be an alkyl or chloride (column 1, line 66 to column 2, line 25), it would have been *prima facie* obvious to one of ordinary skill in the art at the time of invention, to modify the teachings of Buchwald, by substituting the chloride ligand for an alkyl radical ligand, as suggested by Speiser as being functionally equivalent, with a reasonable expectation of success, and the expected benefit of increasing the reaction rate by using a more electron rich metal, as suggested by Buchwald.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Buchwald et al. (USP 6,307,087) as applied to claim 2 above, and further in view of Beach et al. (USP 4,377,528).

Although, Buchwald does not teach these ligands for the X ligands, Buchwald does teach the use of chloride as these ligands. Buchwald also teaches:

"Transition metal catalyst complexes play important roles in many areas of chemistry, including the preparation of polymers and pharmaceuticals. The properties of these catalyst complexes are recognized to be influenced by both the characteristics of the metal and those of the ligands associated with the metal atom. For example, structural features of the ligand can influence reaction rate, regioselectivity, and stereoselectivity. Bulky ligands can be expected to slow reaction rate; electron withdrawing ligands, in coupling reactions, can be expected to slow oxidative addition to, and speed reductive elimination from, the metal center, and electron rich ligands, in coupling reactions, conversely, can be expected to speed oxidative addition to, and slow reductive elimination from, the metal center.

In many cases, the oxidative addition step in the accepted mechanism of a coupling reaction is deemed to be rate limiting. Therefore, adjustments to the catalytic system as a whole that increase the rate of the oxidative addition step should increase the overall reaction rate (column 1, lines 15-35)".

However, because Beach teaches that a catalyst can be made by reacting a ligand with a metal complex, and show that as starting materials bis-phosphine nickel (II) chloride is functionally equivalent with bis-allyl nickel (column 8, lines 10-25), it



would have been prima facie obvious to one of ordinary skill in the art at the time of invention to modify the teachings of Buchwald, by preparing a nickel complex with allyl ligands instead of chloride ligands, as suggested by Beach, with a reasonable expectation of success, and the expected benefit of increasing the reaction rate of the catalyst by using a more electron rich ligand such as allyl instead of chloride, to increase the rate limiting oxidative addition, as suggested by Buchwald.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 2-6 and 9-17 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-10, 12, 13, 15-20, 28-31 and 36-40 of copending Application No. 10/692,827. Although the conflicting

claims are not identical, they are not patentably distinct from each other because the reference does not exclude the use of palladium, however the metals that it teaches read on the instant invention.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### **Response to Arguments**

Applicants argue against the 102 rejection of Buchwald.

Applicants argue that Buchwald does not disclose applicants claimed invention and that nothing within Buchwald discloses, teaches or suggest that one select Applicant's specific combination of claim requirements of interalia, a metal atom specifically iron, cobalt or nickel bound to a bidentate ligand through a nitrogen atom and through a phosphorous atom and thus Buchwald art does not anticipate the claimed invention. This is not persuasive because while Buchwald may not explicitly show the compound made, Buchwald clearly teaches reacting bidentate ligands that read directly on the bidentate ligand claimed, with metal complexes to form new metal complexes, and Buchwald clearly teaches the starting metal complexes a bis-phosphine nickel (II) chloride, and one skilled in the art would appreciate that the specific bidentate ligand with the specific metal starting material, will form a metal complex reading directly on the claimed invention. It is here noted that applicants have provided no evidence that the bidentate ligand will not bind to the starting complex, while displacing the monodentate phosphine ligands, to form a compound reading directly on the of the

instant invention, as it is well known that chelates can easily replace monodentate ligands.

Applicants argue against the 103 rejection over Buchwald in view of Nickias.

Due to applicants amendments to the claims, which required the examiner to amend the rejections, this rejection is no longer present as it has been withdrawn, making most of these arguments moot. However the arguments that are still relevant to the new rejection are addresses below.

Applicants argue that the mere disclosure of Buchwald of a series of catalyst ligands and metals does not necessarily mean that they must coordinate and/or operate in the same way as Applicant's claimed catalyst metal complex, and further that applicants have shown not only based on scientific arguments, but buttressed with disclosure in published prior art documents, how such complexation between metal and ligand is not inherent. This is not persuasive because applicants have provided no convincing evidence of this, actually to the contrary reference cited by applicants show that the bidentate will coordinate as stated by examiner, even if the specific coordination scheme is not the dominant scheme it is displayed. Further it is noted that these references are directed towards palladium and not nickel. Further still if the nickel (II) chloride can not bind in a bidentate manner with the metal as claimed, it is not understood how the same metal and the same will accomplish this in the instant invention.

Applicants argue that the Canich declaration is sworn evidence that must be given due weight by the examiner. This is not persuasive because: 1.) the examiner has given the declaration its due weight, 2.) the opinions (see paragraphs 5 and 6) stated by the inventor are just that opinions, and opinion evidence is given little weight in a declaration 3.) the references all use palladium and not nickel as claimed 4.) nothing in this declaration proves or shows or even suggest in the examiners opinion that the bidentate metal can not react with and form a bidentate complex with the starting metal complex that would result in a complex that reads directly on the instant invention. If applicants so desire the examiner will be happy to provide a larger set of evidence that shows the chelate will form.

Applicants argue that the reference of the declaration show the structure of the corresponding palladium complex to be a different structure from the claimed invention. This is not persuasive for at least the following: 1.) Applicants are requested to actually look at the declaration and scheme 1 of Kocovsky compound 3 (although only 10 % ) reads directly on the claimed bonding structure, 2.) That the reference of Fox states binding of the dimethylamino group is not essential for the catalytic process in no way shows that the dimethylamino will/can not bind to the metal in the claimed fashion (i.e. the amino coordination can be labile and still exist at least partly, reading on the claimed invention), 3.) The references do not show this to be the case for nickel and 4.) Applicants have not shown that their compound will not also do this isomerization.

Applicants argue that of the 58 examples in Buchwald not a single example uses a nickel compound or nickel precursor. This is not persuasive because the reference is

not limited to the specific examples, but is good for all that it teaches, and the reference clearly teaches and anticipates the use of nickel, contrary to applicant's allegation that it does not.

Applicants argue that Buchwald teaches away. This is not persuasive and applicants are reminded that for a reference to teach away there must be some teaching or suggestion that the invention/combination will not work, the examiner can find no such teaching or suggestion and applicants have failed to provide any.

Applicant's argument that Buchwald teaches that the chemistry of nickel and palladium are similar, does not add weight to the unpersuasive declaration submitted.

Applicants argue that the examiner cannot ignore the declaration because the examiner disagrees with it. This is not persuasive because the examiner did not ignore the declaration, the examiner found the declaration not persuasive because the examiner did not agree with the analysis made by the inventor (which the examiner finds as flawed, as there is no suggestion that the amino group will not bind the metal as suggested) of the references based on the inventors opinion, and opinion evidence is given little weight, however, this is irrelevant as the scientific conclusions presented are considered flawed and based on opinion.

Applicants argue that other than applicants compounds there are no other Ni compounds of this type to argue (as CAS reflects in its database). This is not persuasive because the lack of a CAS listing does not mean that the catalyst was not anticipated by the reference.

Applicants argue that it is fair to discuss palladium because they can find no teachings of nickel because they never existed. While this may be true it appears that it would be easy to prove or disprove this with a simple experiment, and the reference even though they are using palladium and if it could be argued that nickel is exactly the same as palladium, the references cited by applicants in the declaration do not show, teach, suggest, or prove that the amino group cannot bind to the metal.

Applicants argue that "Applicants sworn declaration then shows with scientific reason and support why the nickel and the palladium are not equivalent and thus why Buchwald does not disclose the claimed invention. This is not persuasive because Buchwald clearly anticipates the use of nickel, even if no examples are shown using nickel.

Applicants argue that Dr. Canich's conclusion, supported by clear and unchallenged reasoning, takes precedence over the examiners brief and unsupported conclusory statement. This is not persuasive because the reasoning is not clear that the complex cannot form and it is challenged by the examiner with clear scientific reasoning.

Applicants argue against the double patenting rejections.

Applicants argue that the examiner should evaluate which application is the base and which is the improvement and withdraw the double patenting rejection from the base application. This is not persuasive because as the applications were filled on the same day the double patenting is not to show which reference is the base and which is

the improvement, but to show common ownership and interconnectedness of the inventions.

### **Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **JAMES E. MCDONOUGH** whose telephone number is (571)272-6398. The examiner can normally be reached on 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571)272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael A Marcheschi/  
Primary Examiner, Art Unit 1793

JEM 5/10/2009